

VALIDATION REPORT

Site:	Willow Street, Bury
References:	17-285-R3
Date:	10 November 2025
Client:	PLP Construction Ltd





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QUALITY ASSURANCE

Report references	17-285-R3
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REV REF	DESCRIPTION	DATE
01	Final Report	November 2025

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CONTENTS

1. INTRODUCTION	4
1.1. Background	4
1.2. Site Details	4
1.3. Summary of Remediation Works	4
1.4. Proposed Development	5
2. REMEDIATION AND SITE-ENABLING WORKS.....	6
2.1. Site Clearance Operations.....	6
2.2. Delineation & Treatment of Asbestos Impact.....	6
2.3. Excavation, Breaking And Processing of All Above And Below Ground Structures	6
2.4. Independant Validation Watching Brief	6
2.5. Waste Soils Surplus to Requirements	6
3. SECOND PHASE MITIGATION AND MANAGEMENT	7
3.1. Importation of Subsoil & Topsoil	7
3.2. Placement of Cover System.....	7
3.3. Cover System Inspection	7
4. POTABLE WATER SUPPLY PIPEWORK	36
5. GROUND GAS PROTECTION MEASURES.....	37
6. CONCLUSION	50
APPENDIX I: LIMITATIONS.....	51
APPENDIX II: GLOSSARY	53
APPENDIX III: CHEMICAL ANALYSIS RESULTS.....	56
APPENDIX IV: REMEDIATION/VALIDATION CRITERIA	57
APPENDIX VIII: PHOTOS.....	60



1. INTRODUCTION

1.1. BACKGROUND

This report details the remediation and enabling works operations that were undertaken by Adapt Civils Ltd under the supervision of E3P to facilitate the preparation of a low-rise residential development comprising of two apartment blocks with associated gardens, estate roads and infrastructure.

E3P was appointed as an independent Geoenvironmental Consultant for the site remediation, preparation/enabling and validation works and the subsequent production of a suitably detailed report to ensure the satisfaction of the relevant planning conditions for Building Control, warranty providers and the future adoption of infrastructure by the Highways Authority and statutory service providers.

1.2. SITE DETAILS

Site Address	Willow Street, Bury BL9 7QZ
National Grid Reference	E 381800 N 411040
Planning Reference	Bury Council: 69602

All acronyms used within this report are defined in the glossary presented in APPENDIX II.

1.3. SUMMARY OF REMEDIATION WORKS

E3P prepared a E3P Remediation Strategy letter (17-285-L1) dated January 2025) which detailed the proposed remediation activities. E3P understands the Remediation Strategy Letter has been approved by Bury Council.

The Remediation & Enabling Works Strategy Letter should be read both as a precursor to and in conjunction with this document.

The remedial works was formed of the following key elements:

- Turnover of Made Ground and removal of obstructions (to facilitate installation of foundations);
- Placement of >300mm Cover System in soft standing.
- Installation of Type A Barrier Pipe
- Installation of CS2 Ground Gas Protection measures.

The structures and external hardstand served to remove the exposure pathway to future site users, as such, the cover system was limited to small areas of peripheral soft standing.

This report has been prepared to document the completion and validation of each remedial action, as detailed in Section 2.



1.4. PROPOSED DEVELOPMENT

PLP Construction propose to construct two new residential blocks with associated access roads, parking, landscaping and adopted drainage infrastructure.

E3P has been provided with a draft planning layout (Ref: 17-285-002) detailing the proposed construction of two low-rise residential apartment blocks and the refurbishment with associated gardens, estate roads and drainage infrastructure.

A proposed development plan is presented in APPENDIX III as figure 1 (Ref:17-285-002).

FIGURE 1 PROPOSED DEVELOPMENT PLAN





2. REMEDIATION AND SITE-ENABLING WORKS

The focus of the remediation and enabling works are to address the contaminant issues previously identified within the site investigations that presented an unacceptable risk to human health following the redevelopment of the site. For completeness, each of these activities has been discussed below within the context of the actual remediation works that were undertaken on site.

The Remediation & Site Enabling works commenced on the 3rd February 2025 and were completed by the 15th October 2025.

2.1. SITE CLEARANCE OPERATIONS

The site was mainly capped by hardstanding material such as concrete and brick. These materials were stripped where necessary and removed from site for off-site crushing. Once the material was crushed approximately 190m³ was re-imported for reuse for the development platform.

2.2. DELINEATION & TREATMENT OF ASBESTOS IMPACT

No asbestos was identified within the Made Ground during the site investigation. However, the presence of asbestos within the subsurface could not be entirely discounted.

Adapt Civils ensured the site team were Asbestos Awareness trained to ensure site personnel were competent to identify asbestos. In addition, supplementary validation samples of the Made Ground (MG101-MG104) were collected from the previously inaccessible areas in December 2024 to confirm the absence of any asbestos.

The Eurofins Chemtest analysis results (Ref: 24-41709-1) are presented in Appendix III.

2.3. EXCAVATION, BREAKING AND PROCESSING OF ALL ABOVE AND BELOW GROUND STRUCTURES

Obstructions, relict foundations and infrastructure (apart from live services) were to be removed in accordance with the E3P Remediation Strategy Letter (ref; 17-285-L1). During the remediation and enabling works very little was found in terms of below ground structures. Material such as concrete in the form of a concrete pads were encountered and were chased out to their full depth. This material was sent off site to be crushed and imported back to site for reuse as engineered aggregates.

Whilst chasing out below ground obstructions, the contractor on site took extreme care where shallow natural soils were present. This ensured that the natural cohesive deposits remained undisturbed.

2.4. INDEPENDANT VALIDATION WATCHING BRIEF

E3P completed six visits during the enabling works and no evidence of previously unidentified contamination was noted during the site works.

2.5. WASTE SOILS SURPLUS TO REQUIREMENTS

The Made Ground turnover and trench excavations for the foundations produced arising which were removed for off-site processing and/or disposal. E3P understands approximately 1090m³ of material was removed for off-site disposal.

The material was removed by Mahers to either their facility at Daniel Adamson Road, Weaste or Fletcher Bank, Ramsbottom. The waste transfer notes (WTNs) are available upon request.



3. SECOND PHASE MITIGATION AND MANAGEMENT

3.1. IMPORTATION OF SUBSOIL & TOPSOIL

E3P attended the site on 2nd September 2025 to obtain three topsoil samples (TOP301-TOP303) and three subsoil samples (SUB201-SUB203) of the stockpiled soils imported ahead of placement within the within the cover system.

The topsoil and subsoil have been imported via Marchington Stone via from Shire Hill Quarry Sheffield Rd, Glossop SK13 7PU.

Approximately 150m³ of topsoil has been imported for placement within the POS cover system.

Approximately 170m³ of subsoil has been imported for placement within the POS cover system.

Analysis for topsoil and subsoil was undertaken by Chemtest, Eurofins using UKAS accredited methods where applicable.

The results are presented in laboratory analysis results 25-28895-2 appended to this report.

3.2. PLACEMENT OF COVER SYSTEM

An E3P engineer attended site on the 8th October to validate the thickness of the cover system placed within the small areas of landscaping / public open space (POS).

Four hand excavated trial pits were advanced, with the resulting strata detailed at the rear of this letter.

All inspection pits were completed to highlight the required cover system of 300mm; comprising 150mm subsoil and 150mm topsoil.

A small portion of the cover system had not been installed during this inspection, due to service infrastructure installation being awaited before this area could be completed with the cover system.

E3P can confirm that our independent validation demonstrates that the landscaping has been installed with >300mm of certified materials in accordance with the Remediation Strategy.

3.3. COVER SYSTEM INSPECTION

The cover system inspection details and photographs are presented overleaf.



POS (public open space) Cover System Validation

Score	24 / 24 (100%)	Flagged items	0	Actions	0
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Site Name	Willow Street, Bury
Location	4 Maple Avenue Bury England BL9 7PX United Kingdom (53.595347972867415, - 2.276412978623361)
Project Number	17-285
Developer	PLP Construction
Project Manager	A Smith
Conducted By	Joe Newall
Date of visit	8 Oct 2025 11:43 AM BST

SUBSOIL/TOPSOIL MATERIAL SOURCE

(IF THE SITE MANAGER CAN'T SUPPLY YOU WITH DETAIL OF WHERE THE SOIL IS SOURCED STOP THE INSPECTION AND CALL THE PM)

Where has the Subsoil been sourced	Shire Hill Quarry
Where has the Topsoil been sourced	Shire Hill Quarry



Plot Validation 1		6 / 6 (100%)
What Three Words location		///rise.first.ridge
Is Location Ready	Yes	
Installation Standard	Pass	
Depth of Cover System Materials (record the depth and support with Photo down the hole)		300
 		
Photo 1		Photo 2
Depth of Topsoil (mm)		150
Depth of Subsoil (mm)		150
Depth of Cover System at Ground Level (Photo)		☒
		
Photo 3		
Depth of Cover System in Relation to Plot (Ensure the whole plot can be seen in the photo)		☒
 		
Photo 4		Photo 5
Soil suitable (Must be free from Brick, concrete, wood, plastics, glass, metal and anything none natural) if identified contact PM and take photos.		Yes
Geotextile membrane present		Yes
 		
Photo 6		Photo 7

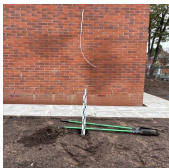
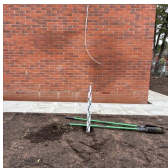


Plot Validation 2		6 / 6 (100%)
What Three Words location		///sling.kite.foods
Is Location Ready	Yes	
Installation Standard	Pass	
Depth of Cover System Materials (record the depth and support with Photo down the hole)		300
 Photo 8Photo 9		
Depth of Topsoil (mm)		150
Depth of Subsoil (mm)		150
Depth of Cover System at Ground Level (Photo)		☒
 Photo 10Photo 11		
Depth of Cover System in Relation to Plot (Ensure the whole plot can be seen in the photo)		☒
 Photo 12Photo 13		
Soil suitable (Must be free from Brick, concrete, wood, plastics, glass, metal and anything none natural) if identified contact PM and take photos.		Yes
Geotextile membrane present		Yes
 Photo 14Photo 15		



Plot Validation 3		6 / 6 (100%)
What Three Words location		///unique.estate.civil
Is Location Ready	Yes	
Installation Standard	Pass	
Depth of Cover System Materials (record the depth and support with Photo down the hole)		300
  Photo 16 Photo 17		
Depth of Topsoil (mm)		150
Depth of Subsoil (mm)		150
Depth of Cover System at Ground Level (Photo)		☒
  Photo 18 Photo 19		
Depth of Cover System in Relation to Plot (Ensure the whole plot can be seen in the photo)		☒
  Photo 20 Photo 21		
Soil suitable (Must be free from Brick, concrete, wood, plastics, glass, metal and anything none natural) if identified contact PM and take photos.		Yes
Geotextile membrane present		Yes
 Photo 22		



Plot Validation 4		6 / 6 (100%)
What Three Words location		///yappy.highs.outfit
Is Location Ready	Yes	
Installation Standard	Pass	
Depth of Cover System Materials (record the depth and support with Photo down the hole)		300
  Photo 23 Photo 24		
Depth of Topsoil (mm)		150
Depth of Subsoil (mm)		150
Depth of Cover System at Ground Level (Photo)		☒
  Photo 25 Photo 26		
Depth of Cover System in Relation to Plot (Ensure the whole plot can be seen in the photo)		☒
  Photo 27 Photo 28		
Soil suitable (Must be free from Brick, concrete, wood, plastics, glass, metal and anything none natural) if identified contact PM and take photos.		Yes
Geotextile membrane present		Yes
  Photo 29 Photo 30		



Site Manager or Representative

Name

Ian Burgess

Signature

A handwritten signature in black ink, appearing to read 'Ian Burgess', written over a light gray rectangular background.

8 Oct 2025 12:26 PM BST



Media Summary



Photo 1



Photo 2



Photo 3



Photo 4



Photo 5



Photo 6



Photo 7



Photo 8



Photo 9



Photo 10



Photo 11



Photo 12



Photo 13



Photo 14



Photo 15



Photo 16



Photo 17



Photo 18



Photo 19

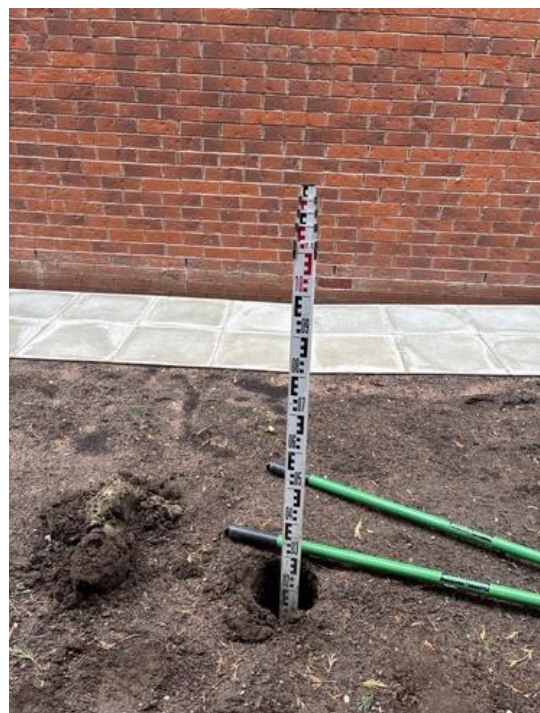


Photo 20



Photo 21



Photo 22



Photo 23



Photo 24



Photo 25



Photo 26

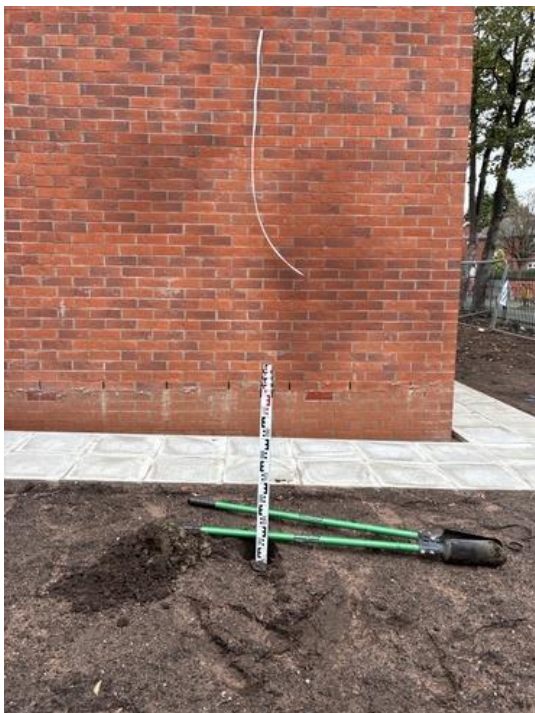


Photo 27

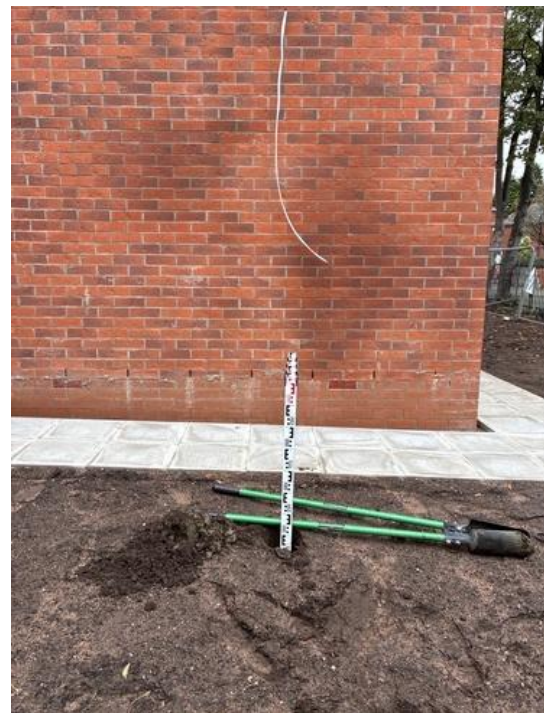


Photo 28



Photo 29



Photo 30



POS (public open space) Cover System Validation

Complete

Score	30 / 30 (100%)	Flagged items	0	Actions	0
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Site Name	Willow St
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Location

2 Maple Avenue
Bury
England
BL9 7PX
United Kingdom
(53.595237660367104, -
2.276325420992025)

Project Number

17285

Developer

PLP Construction

Project Manager

Alex Smith

Conducted By

Jordan James

Date of visit

7 Nov 2025 10:50 AM GMT

Subsoil/Topsoil Material Source
(If The Site Manager Can't Supply You With Detail Of Where
The Soil Is Sourced Stop The Inspection And Call The Pm)

Where has the Subsoil been sourced

Shire Hill Quarry

Where has the Topsoil been sourced

Shire Hill Quarry



PLOT VALIDATION 1

6 / 6 (100%)

What Three Words location

///gravy.script.drop

Is Location Ready

Yes

Installation Standard

Pass

Depth of Cover System Materials (record the depth and support with Photo down the hole)

320



Photo 1



Photo 2

Depth of Topsoil (mm)

320

Depth of Subsoil (mm)

-

Depth of Cover System at Ground Level (Photo)

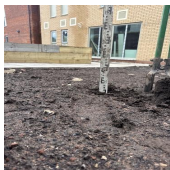


Photo 3

Depth of Cover System in Relation to Plot (Ensure the whole plot can be seen in the photo)



Photo 4

Soil suitable (Must be free from Brick, concrete, wood, plastics, glass, metal and anything none natural) if identified contact PM and take photos.

Yes

Geotextile membrane present

Yes



Photo 5



PLOT VALIDATION 2

6 / 6 (100%)

What Three Words location

///manual.entertainer.shall

Is Location Ready

Yes

Installation Standard

Pass

Depth of Cover System Materials (record the depth and support with Photo down the hole)

300



Photo 6



Photo 7

Depth of Topsoil (mm)

300

Depth of Subsoil (mm)

-

Depth of Cover System at Ground Level (Photo)

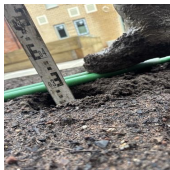


Photo 8

Depth of Cover System in Relation to Plot (Ensure the whole plot can be seen in the photo)

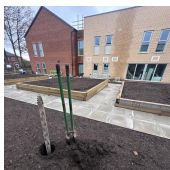


Photo 9

Soil suitable (Must be free from Brick, concrete, wood, plastics, glass, metal and anything none natural) if identified contact PM and take photos.

Yes

Geotextile membrane present

Yes



Photo 10



PLOT VALIDATION 3

6 / 6 (100%)

What Three Words location

///lasted.shovels.sung

Is Location Ready

Yes

Installation Standard

Pass

Depth of Cover System Materials (record the depth and support with Photo down the hole)

320



Photo 11



Photo 12



Photo 13

Depth of Topsoil (mm)

320

Depth of Subsoil (mm)

-

Depth of Cover System at Ground Level (Photo)



Photo 14

Depth of Cover System in Relation to Plot (Ensure the whole plot can be seen in the photo)

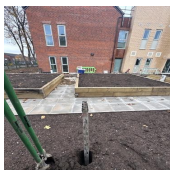


Photo 15

Soil suitable (Must be free from Brick, concrete, wood, plastics, glass, metal and anything none natural) if identified contact PM and take photos.

Yes

Geotextile membrane present

Yes



Photo 16



PLOT VALIDATION 4

6 / 6 (100%)

What Three Words location

///sting.grid.gravy

Is Location Ready

Yes

Installation Standard

Pass

Depth of Cover System Materials (record the depth and support with Photo down the hole)

330



Photo 17



Photo 18

Depth of Topsoil (mm)

330

Depth of Subsoil (mm)

-

Depth of Cover System at Ground Level (Photo)



Photo 19

Depth of Cover System in Relation to Plot (Ensure the whole plot can be seen in the photo)



Photo 20

Soil suitable (Must be free from Brick, concrete, wood, plastics, glass, metal and anything none natural) if identified contact PM and take photos.

Yes

Geotextile membrane present

Yes



Photo 21



PLOT VALIDATION 5

6 / 6 (100%)

What Three Words location

///paused.shin.soccer

Is Location Ready

Yes

Installation Standard

Pass

Depth of Cover System Materials (record the depth and support with Photo down the hole)

350



Photo 22



Photo 23

Depth of Topsoil (mm)

350

Depth of Subsoil (mm)

-

Depth of Cover System at Ground Level (Photo)



Photo 24

Depth of Cover System in Relation to Plot (Ensure the whole plot can be seen in the photo)



Photo 25

Soil suitable (Must be free from Brick, concrete, wood, plastics, glass, metal and anything none natural) if identified contact PM and take photos.

Yes

Geotextile membrane present

Yes



Photo 26



SITE MANAGER OR REPRESENTATIVE

Name

Ian Burgess - PLP

Signature

A handwritten signature in black ink, appearing to be 'Ian Burgess', written on a light gray rectangular background.

7 Nov 2025 11:12 AM GMT



Media Summary



Photo 1



Photo 2



Photo 3



Photo 4



Photo 5



Photo 6



Photo 7



Photo 8



Photo 9



Photo 10



Photo 11



Photo 12



Photo 13



Photo 14



Photo 15



Photo 16



Photo 17



Photo 18



Photo 19



Photo 20



Photo 21



Photo 22



Photo 23



Photo 24



Photo 25



Photo 26



4. POTABLE WATER SUPPLY PIPEWORK

E3P can confirm that Barrier (Type A) Pipework has been installed. Figures 4.1 and 4.2 below record the installation of the pipework.

FIGURE 4.1 INSTALLED BARRIER (TYPE A) PIPEWORK



FIGURE 4.2 INSTALLED BARRIER (TYPE A) PIPEWORK





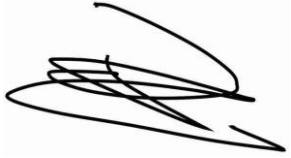
5. GROUND GAS PROTECTION MEASURES

As a precautionary measure the apartment was installed with a CS2 ground gas protection measures.

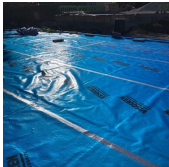
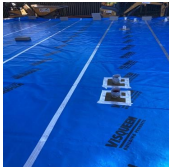
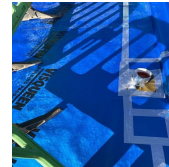
A summary of the inspection is provided below.

TAPED GAS MEMBRANE VALIDATION

Score	17 / 17 (100%)	Flagged items	0	Actions	0
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Site Name	Willow street
Location	Bury Contract Services, Willow Street Bury England BL9 7QZ United Kingdom (53.595687835276735, -2.2761432439172467)
Project Manager	Alex Smith
Project number	17-285
Developer	PLP Construction
Site representative Signature	 Ian Burgess 18 Mar 2025 3:29 PM GMT
Conducted on	18 Mar 2025 2:57 PM GMT
Prepared by	Ben Whalley
Have you got the correct Gas Membrane detail (attached to the job in synergist)?	Yes



PLOT INSPECTION 1		16 / 16 (100%)
Plot Number		Apartment(s)
Type of Development: if other add Note	Apartment	
Floor Slab Type	Pre-Cast Suspended	
Are telescopic vents present?	Yes	
Gas Membrane Type: Manufacturer, gauge, and colour. (Take photos where possible showing Label)	Blue - Visqueen	
Installer's name, company and qualification	Adapt	
Gas Membrane Condition: Open punctures, tears, rips, stretching, Presence of debris, Repairs, Signs of weakness such as raised or sunken indentations, Protection plan in place to restrict access to laid gas membrane? IF FAIL DESCRIPTION IN ACTIONS AND PHOTOS REQUIRED	Pass	
Laps and joints seals: Joints lapped and sealed in accordance with manufacturer's requirements/ specification? Minimum overlap insured? Folds running in line with joints? (no joints cutting across folds)	Pass	
   Photo 1 Photo 2 Photo 3		
Are all joints taped?	Yes	
     Photo 4 Photo 5 Photo 6 Photo 7 Photo 8		
Is appropriate joining/double-sided tape used?	Yes	
Are Sections taped twice?	Yes	
Service entries seals: Top hats seal arrangements fixed around service entries? Use of Jubilee clips or Bitumastic Sealant	Pass	

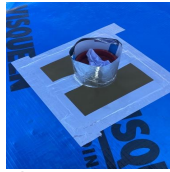


Photo 9

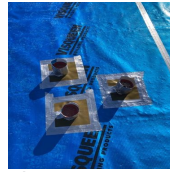


Photo 10

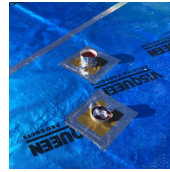


Photo 11



Photo 12

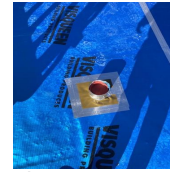


Photo 13

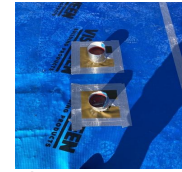


Photo 14

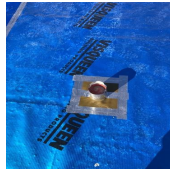


Photo 15

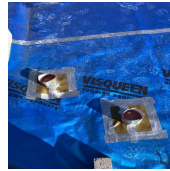


Photo 16

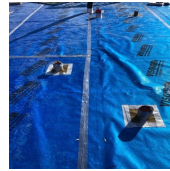


Photo 17

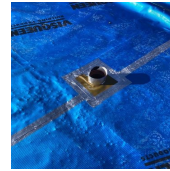


Photo 18

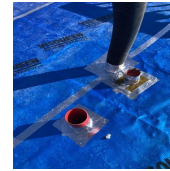


Photo 19

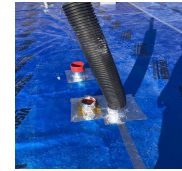


Photo 20

Corners / Internal joints: Check all corners are correctly formed or contractor has used preformed corners.

Pass

Are folds running in line with joints? (no joints cutting across folds)

Pass

Extent of Coverage: Is the membrane covering the entire plot? Does membrane span over outside walls?

Yes

Sealant to the underside of the membrane at the sole plate position. (check with PM if required if not on the schedule)

N/A

Condition of sub-grade and underside of gas membrane: Check that the subgrade does not contain rough/uneven surfaces, is appropriately clean and that there are no hard/sharp objects. That protective sand blinding or geotextile (if specified) is present and meets the design criteria. (Lift back the membrane and photo the subfloor)

Pass

Slab / membrane condition (is membrane clear of snow, standing water, debris or insulation): Can membrane be fully seen and photographed – ask contractor to remove any debris so membrane can be fully seen an inspected – this is a requirement of NHBC and local authorities.

Pass

External Wall Air bricks: Numbers, size. positions as design drawing? (Minimum of 3 walls)

Pass



Photo 21

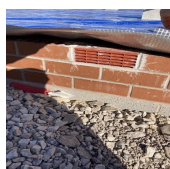


Photo 22



Photo 23



Photo 24



Photo 25



Photo 26



Photo 27



Photo 28



Photo 29



Photo 30



Photo 31



Photo 32



Photo 33



Photo 34



Photo 35



Photo 36



Photo 37

Passive Venting

**Sub-floor Void: Is a check possible on future plots
(insert Plot number or NO in text box)**

N/A



Media Summary



Photo 1



Photo 2



Photo 3



Photo 4



Photo 5



Photo 6



Photo 7



Photo 8

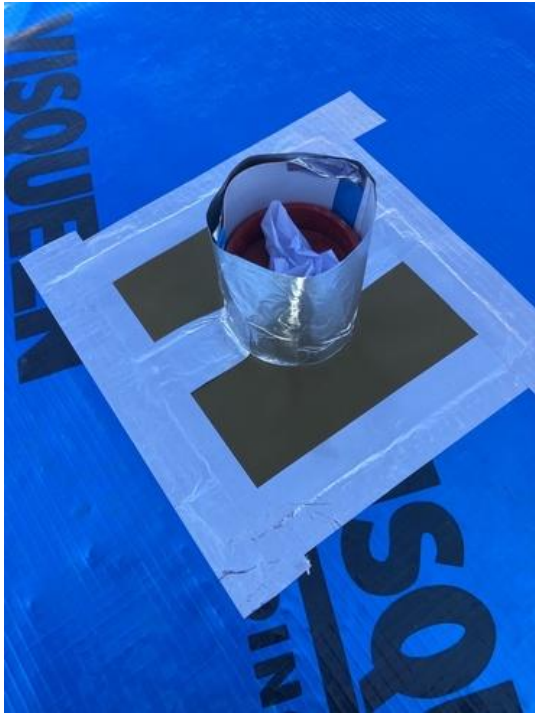


Photo 9

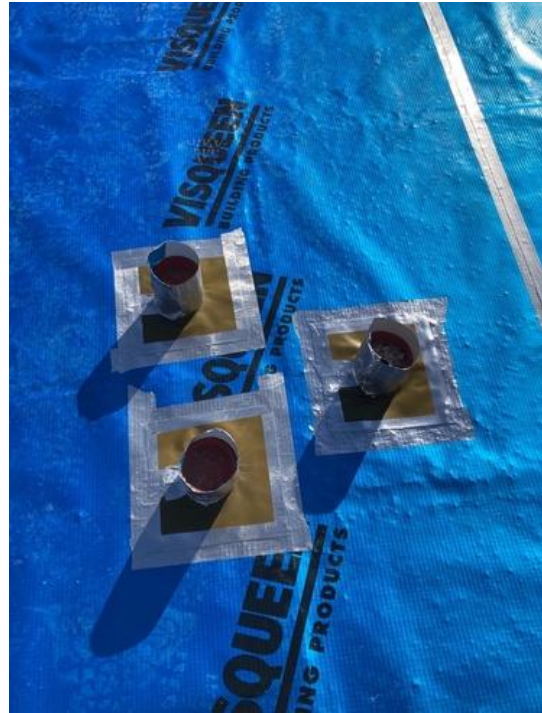


Photo 10

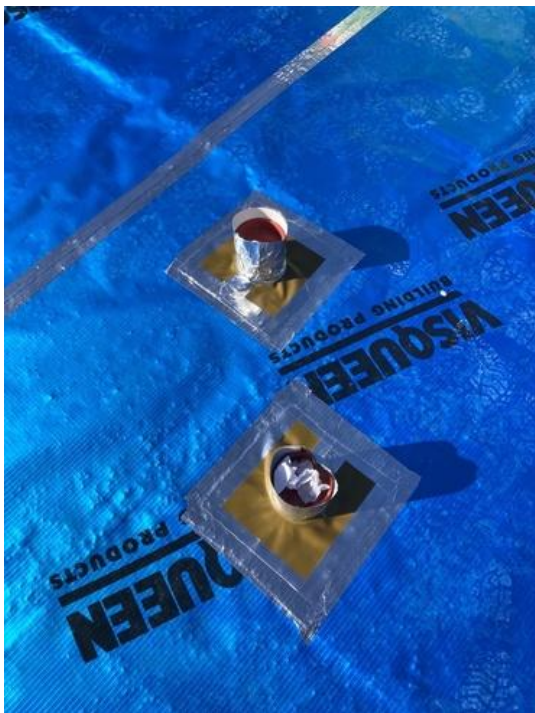


Photo 11



Photo 12

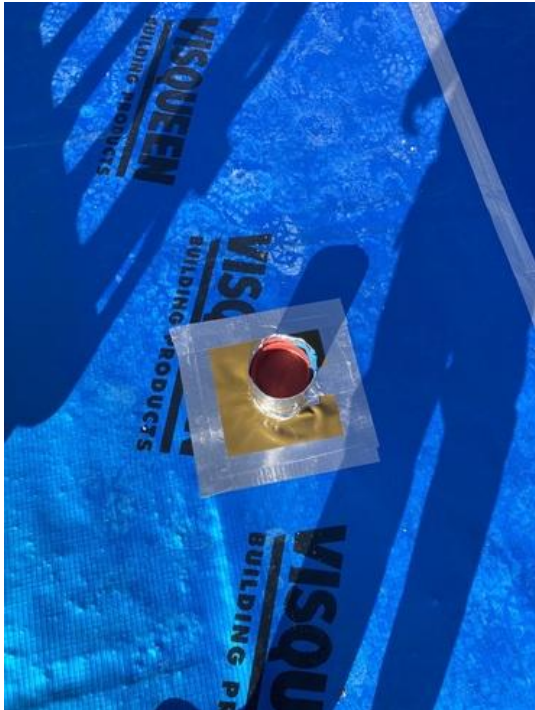


Photo 13



Photo 14



Photo 15



Photo 16



Photo 17



Photo 18

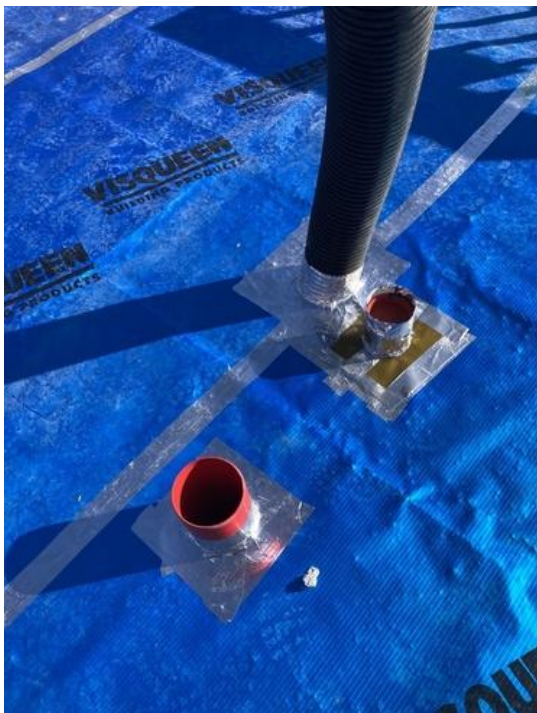


Photo 19



Photo 20



Photo 21



Photo 22



Photo 23



Photo 24



Photo 25



Photo 26



Photo 27



Photo 28



Photo 29



Photo 30



Photo 31



Photo 32



Photo 33



Photo 34



Photo 35



Photo 36



Photo 37

6. CONCLUSION

The remediation elements identified within the approved Remediation Strategy have been completed with validation testing completed to the required standard.

END OF REPORT

Appendix I: Limitations





GENERAL

This report and any associated works (together comprising the "Services") were compiled and carried out by E3P for the client (as present in Section 1) under the E3P "Terms of Business" or with those parties with whom a warranty agreement has been executed, or with whom an assignment has been agreed and outlined in the body of the report.

Unless explicitly agreed otherwise, in writing, this report has been prepared under E3P Standard Terms and Business as included within our proposal to the Client.

Project-specific appointment documents may be agreed upon at our discretion and a charge may be levied for both the time to review and finalise appointment documents and also for associated changes to the appointment terms. E3P reserves the right to amend the fee should any changes to the appointment terms create an increased risk to E3P.

The report needs to be considered in light of the proposal and associated limitations of scope. The report needs to be read in full and isolated sections cannot be used without full reference to other elements of the report and any previous works referenced within the report.

DETAILED QUANTITATIVE RISK ASSESSMENTS AND REMEDIATION AND ENABLING WORK STRATEGY REPORTS

These reports build upon previous report versions and associated notes. The scope of the investigation, further testing and monitoring and associated risk assessments were selected based on the specific development and land use scenario proposed by the Client and may not be appropriate to another form of development or scheme layout. The risk assessment and opinions provided are based on currently available approaches in the generation of Site Specific Assessment Criteria relating to contamination concentrations and are not considered to represent a risk in a specific land use scenario to a specific receptor. No liability can be accepted for the retrospective effects of any future changes or amendments to these values, associated models or associated guidance.

The outputs of the Detailed Quantitative Risk Assessments are based upon the manipulation of standard risk assessment models. These are our interpretation of the risk assessment criteria.

Before adoption on-site, assessment criteria will need to be discussed and agreed upon with the Regulatory Authorities prior to adoption on site. The regulatory discussion and engagement process may result in an alternative interpretation being determined and agreed. The process and timescales associated with the Regulatory Authority engagement are not within the control of E3P. All costs and programmes presented as a result of this process should be validated by a quantity surveyor and should be presumed to be indicative.

E3P does not accept liability for any subcontract work that has not been completed in strict accordance with an approved E3P Remediation and Enabling Works Strategy.

Appendix II: Glossary





ACM	Asbestos-containing material	MMP	Materials management plan
ADS	Acoustic design statement	ND	Not detected
AST	Above-ground storage tank	NDP	Nuclear density probe
BGS	British Geological Survey	NMP	Noise Management Plan
BSI	British Standards Institute	NPSE	Noise Policy Statement For England
BTEX	Benzene, toluene, ethylbenzene, xylenes	NR	Not recorded
MRA	Mining Remediation Authority	PAH	Polycyclic aromatic hydrocarbon
CBR	California bearing ratio	PCB	Polychlorinated biphenyl
CIEH	Chartered Institute of Environmental Health	PI	Plasticity index
CIRIA	Construction Industry Research Association	PID	Photo ionisation detector
CLEA	Contaminated land exposure assessment	POS	Public open space
CML	Council of Mortgage Lenders	PPE	Personnel protective equipment
CoC	Contaminants of concern	ProPG	Professional practice guidance
CSM	Conceptual site model	QA	Quality assurance
DNAPL	Dense non-aqueous phase liquid (chlorinated solvents, PCB)	SGV	Soil guideline value
DWS	Drinking water standard	SPH	Separate-phase hydrocarbon
EA	Environment Agency	SPT	Standard penetration test
EQS	Environmental quality standard	SVOC	Semi-volatile organic compound
FFL	Finished floor level	TPH	Total and speciated petroleum hydrocarbon
GAC	General assessment criteria	TPH CWG	Total Petroleum Hydrocarbon (Criteria Working Group)
GL	Ground level	UKWIR	United Kingdom Water Infrastructure Risk
GSV	Gas screening value	UST	Underground storage tank
HCV	Health criteria value	VCC	Vibro-concrete column
ICSM	Initial conceptual site model	VOC	Volatile organic compound
LEL	Lower explosive limit	VRSC	Vibro-replacement stone columns
LMRL	Lower method reporting limit	VSC	Vibro-stone columns
LNAPL	Light non-aqueous phase liquid (petrol, diesel, kerosene)	WHO	World Health Organisation



MCV	Moisture condition value	WRAP	Waste and Resources Action Programme
MIBK	Methyl isobutyl ketone	WTE	Water table elevation
m	Metres	ppm	Parts per million
km	Kilometres	mg/m³	Milligram per metre cubed
% v/v	Percent volume in air	m bgl	Metres below ground level
mb	Millibars (atmospheric pressure)	m bcl	Metre below cover level
l/hr	Litres per hour	mAOD	Metres above ordnance datum (sea level)
µg/l	Micrograms per litre (parts per billion)	kN/m²	Kilonewtons per metre squared
ppb	Parts per billion	µm	Micrometre
mg/kg	Milligrams per kilogram (parts per million)	SSRT	Site Specific Remediation Target
PSD	Particle Size Distribution	DD	Dry Density
CL:AIRE	Contaminated Land: Applications in Real Environments	Mc	Moisture Content
ρ	Bulk Density	GPR	Ground Penetrating Radar
NDP	Nuclear Density Probe	FFL	Finished Floor Level
LEL	Lower Explosive Limit	UKWIR	UK Water Industry Research
CIRIA	Construction Industry Research and Information Association	LOD	Limit of Detection
PFAS	Per- and Poly-Fluorinated Substances	PFOA	Perfluorooctanoic Acid

Appendix III: Chemical Analysis Results





Final Report

Report No.: 24-41709-1

Initial Date of Issue: 06-Jan-2025

Re-Issue Details:

Client E3P

Client Address: Taylor Road
Trafford Park
Urmston
Manchester
M41 7JQ

Contact(s): asmith@e3p.co.uk;
bwhalley@e3p.co.uk

Project Willow street

Quotation No.: **Date Received:** 18-Dec-2024

Order No.: 010262 **Date Instructed:** 18-Dec-2024

No. of Samples: 6

Turnaround (Wkdays): 5 **Results Due:** 24-Dec-2024

Date Approved: 06-Jan-2025

Approved By:

Details: David Smith, Technical Director

For details about application of accreditation to specific matrix types, please refer to the Table at the back of this report

Results - Leachate

Project: Willow street

Client: E3P	Chemtest Job No.:					24-41709
Quotation No.:	Chemtest Sample ID.:					1911648
	Client Sample ID.:					MG-105
	Sample Type:					SOIL
	Date Sampled:					16-Dec-2024
	Time Sampled:					12:00
Determinand	Accred.	SOP	Type	Units	LOD	
pH at 20C	U	1010	2:1		4.0	9.1
Cyanide (Total) Low-Level	N	1300	2:1	mg/l	0.0050	< 0.0050
Arsenic (Dissolved)	U	1455	2:1	µg/l	0.20	2.0
Cadmium (Dissolved)	U	1455	2:1	µg/l	0.11	< 0.11
Chromium (Dissolved)	U	1455	2:1	µg/l	0.50	3.8
Copper (Dissolved)	U	1455	2:1	µg/l	0.50	3.8
Mercury (Dissolved)	U	1455	2:1	µg/l	0.05	< 0.05
Nickel (Dissolved)	U	1455	2:1	µg/l	0.50	0.69
Lead (Dissolved)	U	1455	2:1	µg/l	0.50	< 0.50
Selenium (Dissolved)	U	1455	2:1	µg/l	0.50	1.3
Zinc (Dissolved)	U	1455	2:1	µg/l	2.5	8.8
Chromium (Hexavalent)	U	1490	2:1	µg/l	20	< 20
C2 Aliphatic TPH >C5-C6	N	1675	2:1	µg/l	0.10	[C] < 0.10
C2 Aliphatic TPH >C6-C8	N	1675	2:1	µg/l	0.10	[C] < 0.10
C2 Aliphatic TPH >C8-C10	N	1675	2:1	µg/l	0.10	[C] < 0.10
C2 Aliphatic TPH >C10-C12	N	1675	2:1	µg/l	0.10	[C] < 0.10
C2 Aliphatic TPH >C12-C16	N	1675	2:1	µg/l	0.10	[C] < 0.10
C2 Aliphatic TPH >C16-C21	N	1675	2:1	µg/l	0.10	[C] < 0.10
C2 Aliphatic TPH >C21-C35	N	1675	2:1	µg/l	0.10	[C] < 0.10
C2 Aliphatic TPH >C35-C44	N	1675	2:1	µg/l	0.10	[C] < 0.10
Total Aliphatic Hydrocarbons	N	1675	2:1	µg/l	5.0	[C] < 5.0
C2 Aromatic TPH >C5-C7	N	1675	2:1	µg/l	0.10	[C] < 0.10
C2 Aromatic TPH >C7-C8	N	1675	2:1	µg/l	0.10	[C] < 0.10
C2 Aromatic TPH >C8-C10	N	1675	2:1	µg/l	0.10	[C] < 0.10
C2 Aromatic TPH >C10-C12	N	1675	2:1	µg/l	0.10	[C] < 0.10
C2 Aromatic TPH >C12-C16	N	1675	2:1	µg/l	0.10	[C] < 0.10
C2 Aromatic TPH >C16-C21	N	1675	2:1	µg/l	0.10	[C] < 0.10
C2 Aromatic TPH >C21-C35	N	1675	2:1	µg/l	0.10	[C] < 0.10
C2 Aromatic TPH >C35-C44	N	1675	2:1	µg/l	0.10	[C] < 0.10
C2 Total Aromatic Hydrocarbons	N	1675	2:1	µg/l	5.0	[C] < 5.0
Total Petroleum Hydrocarbons	N	1675	2:1	µg/l	10	[C] < 10
Benzene	U	1760	2:1	µg/l	1.0	[C] < 1.0
Toluene	U	1760	2:1	µg/l	1.0	[C] < 1.0
Ethylbenzene	U	1760	2:1	µg/l	1.0	[C] < 1.0
m & p-Xylene	U	1760	2:1	µg/l	1.0	[C] < 1.0
o-Xylene	U	1760	2:1	µg/l	1.0	[C] < 1.0
Methyl Tert-Butyl Ether	N	1760	2:1	µg/l	1.0	[C] < 1.0
Naphthalene	U	1800	2:1	µg/l	0.10	< 0.10
Acenaphthylene	U	1800	2:1	µg/l	0.10	< 0.10
Acenaphthene	U	1800	2:1	µg/l	0.10	< 0.10

Results - Leachate

Project: Willow street

Client: E3P	Chemtest Job No.: 24-41709					
Quotation No.:	Chemtest Sample ID.: 1911648					
	Client Sample ID.: MG-105					
	Sample Type: SOIL					
	Date Sampled: 16-Dec-2024					
	Time Sampled: 12:00					
Determinand	Accred.	SOP	Type	Units	LOD	
Fluorene	U	1800	2:1	µg/l	0.10	< 0.10
Phenanthrene	U	1800	2:1	µg/l	0.10	< 0.10
Anthracene	U	1800	2:1	µg/l	0.10	< 0.10
Fluoranthene	U	1800	2:1	µg/l	0.10	< 0.10
Pyrene	U	1800	2:1	µg/l	0.10	< 0.10
Benzo[a]anthracene	U	1800	2:1	µg/l	0.10	< 0.10
Chrysene	U	1800	2:1	µg/l	0.10	< 0.10
Benzo[b]fluoranthene	U	1800	2:1	µg/l	0.10	< 0.10
Benzo[k]fluoranthene	U	1800	2:1	µg/l	0.10	< 0.10
Benzo[a]pyrene	U	1800	2:1	µg/l	0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	1800	2:1	µg/l	0.10	< 0.10
Dibenz(a,h)Anthracene	U	1800	2:1	µg/l	0.10	< 0.10
Benzo[g,h,i]perylene	U	1800	2:1	µg/l	0.10	< 0.10
Total Of 16 PAH's	U	1800	2:1	µg/l	2.0	< 2.0
Total Phenols	U	1920	2:1	mg/l	0.030	< 0.030

Results - Soil

Project: Willow street

Client: E3P		Chemtest Job No.: 24-41709 24-41709 24-41709 24-41709 24-41709								
Quotation No.:		Chemtest Sample ID.: 1911643 1911644 1911645 1911646 1911647								
		Client Sample ID.: MG-101 MG-102 MG-103 MG-104 NAT-101								
		Sample Type: SOIL SOIL SOIL SOIL SOIL								
		Date Sampled: 16-Dec-2024 16-Dec-2024 16-Dec-2024 16-Dec-2024 16-Dec-2024								
		Time Sampled: 12:00 12:00 12:00 12:00 12:00								
		Asbestos Lab: NEW-ASB NEW-ASB NEW-ASB NEW-ASB NEW-ASB								
Determinand	HWOL Code	Accred.	SOP	Units	LOD					
ACM Type		U	2192		N/A	-	-	-	-	-
Asbestos Identification		U	2192		N/A	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Moisture		N	2030	%	0.020	16	16	11	15	17
Soil Colour		N	2040		N/A	Brown	Brown	Brown	Brown	Brown
Other Material		N	2040		N/A	Stones and brick	Stones and Roots	Stones	Stones and brick	Stones
Soil Texture		N	2040		N/A	Sand	Sand	Sand	Sand	Sand
pH at 20C		M	2010		4.0	9.7	9.3	10.4	9.2	8.1
Sulphate (2:1 Water Soluble) as SO4		M	2120	g/l	0.010	0.029	0.19	0.75	0.055	0.23
Total Sulphur		U	2175	%	0.010	0.11	0.12	0.15	0.17	0.090
Cyanide (Total)		M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Sulphide (Easily Liberatable)		N	2325	mg/kg	0.50	2.9	4.7	4.4	2.5	2.6
Sulphate (Total)		U	2430	%	0.010	0.24	0.19	0.36	0.30	0.11
Arsenic		M	2455	mg/kg	0.5	13	10	17	32	12
Cadmium		M	2455	mg/kg	0.10	4.2	0.29	0.84	0.35	0.39
Chromium		M	2455	mg/kg	0.5	29	14	28	18	25
Copper		M	2455	mg/kg	0.50	62	45	61	110	24
Mercury		M	2455	mg/kg	0.05	0.13	0.10	0.25	0.55	0.08
Nickel		M	2455	mg/kg	0.50	30	15	25	31	29
Lead		M	2455	mg/kg	0.50	310	65	170	280	42
Selenium		M	2455	mg/kg	0.25	0.79	0.45	0.80	0.91	1.0
Zinc		M	2455	mg/kg	0.50	730	110	280	130	82
Chromium (Hexavalent)		N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Organic Matter		M	2625	%	0.40	4.7	7.8	4.8	2.4	2.4
Total Organic Carbon		M	2625	%	0.20	2.7	4.6	2.8	1.4	1.4
TPH >C6-C8	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH >C8-C10	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH >C10-C12	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH >C12-C16	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	3.9	14	< 1.0	< 1.0
TPH >C16-C21	EH_1D_Total	N	2670	mg/kg	1.0	64	63	250	8.2	< 1.0
TPH >C21-C25	EH_1D_Total	N	2670	mg/kg	1.0	83	210	260	16	< 1.0
TPH >C25-C35	EH_1D_Total	N	2670	mg/kg	1.0	180	1700	520	14	< 1.0
TPH >C35-C40	EH_1D_Total	N	2670	mg/kg	1.0	23	770	88	< 1.0	< 1.0
Total TPH >C6-C40	EH_1D_Total	U	2670	mg/kg	10	350	2800	1100	38	< 10
Naphthalene		M	2800	mg/kg	0.10	0.74	0.31	< 0.10	< 0.10	< 0.10
Acenaphthylene		N	2800	mg/kg	0.10	0.46	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene		M	2800	mg/kg	0.10	6.1	2.2	4.2	< 0.10	< 0.10
Fluorene		M	2800	mg/kg	0.10	4.3	1.7	3.0	< 0.10	< 0.10

Results - Soil

Project: Willow street

Client: E3P		Chemtest Job No.:					24-41709	24-41709	24-41709	24-41709	24-41709
Quotation No.:		Chemtest Sample ID.:					1911643	1911644	1911645	1911646	1911647
		Client Sample ID.:					MG-101	MG-102	MG-103	MG-104	NAT-101
		Sample Type:					SOIL	SOIL	SOIL	SOIL	SOIL
		Date Sampled:					16-Dec-2024	16-Dec-2024	16-Dec-2024	16-Dec-2024	16-Dec-2024
		Time Sampled:					12:00	12:00	12:00	12:00	12:00
		Asbestos Lab:					NEW-ASB	NEW-ASB	NEW-ASB	NEW-ASB	NEW-ASB
Determinand	HWOL Code	Accred.	SOP	Units	LOD						
Phenanthrene		M	2800	mg/kg	0.10	45	16	31	2.2	1.3	
Anthracene		M	2800	mg/kg	0.10	13	4.6	10	0.75	0.34	
Fluoranthene		M	2800	mg/kg	0.10	75	22	50	4.1	2.6	
Pyrene		M	2800	mg/kg	0.10	64	19	42	3.5	2.2	
Benzo[a]anthracene		M	2800	mg/kg	0.10	31	8.4	19	1.5	0.98	
Chrysene		M	2800	mg/kg	0.10	31	8.5	19	1.6	0.85	
Benzo[b]fluoranthene		M	2800	mg/kg	0.10	39	9.7	22	1.8	1.2	
Benzo[k]fluoranthene		M	2800	mg/kg	0.10	14	3.4	8.1	0.68	0.39	
Benzo[a]pyrene		M	2800	mg/kg	0.10	33	8.2	19	1.4	0.80	
Indeno(1,2,3-c,d)Pyrene		M	2800	mg/kg	0.10	18	4.4	10	0.79	< 0.10	
Dibenz(a,h)Anthracene		N	2800	mg/kg	0.10	3.4	0.93	2.1	< 0.10	< 0.10	
Benzo[g,h,i]perylene		M	2800	mg/kg	0.10	17	4.1	8.9	0.86	< 0.10	
Total Of 16 PAH's		N	2800	mg/kg	2.0	400	110	250	19	11	
Total Phenols		M	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	

Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63. Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request. The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

Sample:	Sample Ref:	Sample ID:	Sample Location:	Sampled Date:	Deviation Code(s):	Containers Received:
1911648		MG-105		16-Dec-2024	C	Plastic Tub 500g

Test Methods

SOP	Title	Parameters included	Method summary	Water Accred.
1010	pH Value of Waters	pH at 20°C	pH Meter	
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.	
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).	RE PW PL SW DW FW
1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazine.	
1675	TPH Aliphatic/Aromatic split in Waters by GC-FID(cf. Texas Method 1006 / TPH CWG)	Aliphatics: >C5–C6, >C6–C8, >C8– C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Pentane extraction / GCxGC FID detection	
1760	Volatile Organic Compounds (VOCs) in Waters by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics. (cf. USEPA Method 8260)	Automated headspace gas chromatographic (GC) analysis of water samples with mass spectrometric (MS) detection of volatile organic compounds.	
1800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-MS	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Pentane extraction / GCMS detection	
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.	
2010	pH Value of Soils	pH at 20°C	pH Meter	
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <30°C.	
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930	
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES	
2175	Total Sulphur in Soils	Total Sulphur	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.	
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry	
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Alkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.	
2325	Sulphide in Soils	Sulphide	Steam distillation with sulphuric acid / analysis by 'Aquakem 600' Discrete Analyser, using N,N-dimethyl-p-phenylenediamine.	
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.	
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.	
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazine.	

Test Methods

SOP	Title	Parameters included	Method summary	Water Accred.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.	
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID	
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS	
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.	
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge	
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge	

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

This report shall not be reproduced except in full, and only with the prior approval of the laboratory.

Any comments or interpretations are outside the scope of UKAS accreditation.

The Laboratory is not accredited for any sampling activities and reported results relate to the samples 'as received' at the laboratory.

Uncertainty of measurement for the determinands tested are available upon request .

None of the results in this report have been recovery corrected.

All results are expressed on a dry weight basis.

The following tests were analysed on samples 'as received' and the results subsequently corrected to a dry weight basis EPH, VPH, TPH, BTEX, VOCs, SVOCs, PCBs, Phenols.

For all other tests the samples were dried at $\leq 30^{\circ}\text{C}$ prior to analysis.

All Asbestos testing is performed at the indicated laboratory .

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1.

Sample Deviation Codes

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container
- E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt.

All water samples will be retained for 14 days from the date of receipt.

Charges may apply to extended sample storage.

Water Sample Category Key for Accreditation

- DW - Drinking Water
- GW - Ground Water
- LE - Land Leachate
- NA - Not Applicable

Report Information

PL - Prepared Leachate
PW - Processed Water
RE - Recreational Water
SA - Saline Water
SW - Surface Water
TE - Treated Effluent
TS - Treated Sewage
UL - Unspecified Liquid

Clean Up Codes

NC - No Clean Up
MC - Mathematical Clean Up
FC - Florisil Clean Up

HWOL Acronym System

HS - Headspace analysis
EH - Extractable hydrocarbons – i.e. everything extracted by the solvent
CU - Clean-up – e.g. by Florisil, silica gel
1D - GC – Single coil gas chromatography
Total - Aliphatics & Aromatics
AL - Aliphatics only
AR - Aromatic only
2D - GC-GC – Double coil gas chromatography
#1 - EH_2D_Total but with humics mathematically subtracted
#2 - EH_2D_Total but with fatty acids mathematically subtracted
+ - Operator to indicate cumulative e.g. EH+EH_Total or EH_CU+HS_Total

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com



Amended Report

Report No.: 25-28895-2

Initial Date of Issue: 18-Sep-2025 **Date of Re-Issue:** 18-Sep-2025

Re-Issue Details: This report has been revised and directly supersedes 25-28895-1 in its entirety

Client E3P

Client Address: Taylor Road
Trafford Park
Urmston
Manchester
M41 7JQ

Contact(s): asmith@e3p.co.uk

Project Willow Street, Bury

Quotation No.: Q23-31421 **Date Received:** 04-Sep-2025

Order No.: 012160 **Date Instructed:** 04-Sep-2025

No. of Samples: 6

Turnaround (Wkdays): 5 **Results Due:** 10-Sep-2025

Date Approved: 18-Sep-2025

Approved By:

Details: David Smith, Technical Director

For details about application of accreditation to specific matrix types, please refer to the Table at the back of this report

Results - Soil

Project: Willow Street, Bury

Client: E3P		Chemtest Job No.:				25-28895	25-28895	25-28895	25-28895	25-28895	25-28895
Quotation No.: Q23-31421		Chemtest Sample ID.:				2023352	2023353	2023354	2023355	2023356	2023357
Order No.: 012160		Client Sample Ref.:				1	2	3	4	5	6
		Client Sample ID.:				TS101	TS102	TS103	SS101	SS102	SS103
		Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Date Sampled:				02-Sep-2025	02-Sep-2025	02-Sep-2025	02-Sep-2025	02-Sep-2025	02-Sep-2025
		Time Sampled:				12:00	12:00	12:00	12:00	12:00	12:00
		Asbestos Lab:				DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	HWOL Code	Accred.	SOP	Units	LOD						
ACM Type		N	2192		N/A	-	-	-	-	-	-
Asbestos Identification		U	2192		N/A	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Moisture		N	2030	%	0.020	10	13	14	8.9	11	9.3
Soil Colour		N	2030		N/A	Brown	Brown	Brown	Brown	Brown	Brown
Other Material		N	2030		N/A	Stones and Roots	Stones and Roots	Roots and Stones	Stones	Stones	Stones
Soil Texture		N	2030		N/A	Loam	Loam	Loam	Sand	Sand	Sand
pH at 20C		M	2010		4.0	8.9	8.6	8.5	8.8	8.8	8.7
Sulphate (2:1 Water Soluble) as SO4		M	2120	g/l	0.010	0.72	0.10	0.064	0.097	0.031	0.047
Total Sulphur		U	2175	%	0.010	0.046	0.055	0.058	< 0.010	< 0.010	< 0.010
Cyanide (Total)		M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Sulphide (Easily Liberatable)		N	2325	mg/kg	0.50	2.0	4.7	9.5	1.8	2.5	2.0
Sulphate (Total)		U	2430	%	0.010	0.075	0.059	0.071	< 0.010	0.013	< 0.010
Arsenic		M	2455	mg/kg	0.5	1.8	1.5	1.8	1.9	0.7	0.7
Cadmium		M	2455	mg/kg	0.10	< 0.10	< 0.10	< 0.10	0.15	< 0.10	< 0.10
Chromium		M	2455	mg/kg	0.5	5.3	5.6	5.1	19	7.4	7.3
Copper		M	2455	mg/kg	0.50	9.3	6.6	8.4	10	3.8	3.7
Mercury		M	2455	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nickel		M	2455	mg/kg	0.50	5.2	4.0	5.3	21	8.2	7.9
Lead		M	2455	mg/kg	0.50	16	11	13	14	3.7	3.5
Selenium		M	2455	mg/kg	0.25	0.37	0.36	0.38	0.64	0.36	0.30
Zinc		M	2455	mg/kg	0.50	28	27	25	52	43	20
Chromium (Hexavalent)		N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Organic Matter		M	2625	%	0.40	5.6	7.9	5.2	0.54	0.57	0.41
Total Organic Carbon		M	2625	%	0.20	3.3	4.6	3.0	0.31	0.33	0.24
TPH >C6-C8	EH 1D Total	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH >C8-C10	EH 1D Total	N	2670	mg/kg	1.0	4.4	5.5	4.5	< 1.0	< 1.0	< 1.0
TPH >C10-C12	EH 1D Total	N	2670	mg/kg	1.0	2.0	2.9	2.1	< 1.0	< 1.0	< 1.0
TPH >C12-C16	EH 1D Total	N	2670	mg/kg	1.0	4.8	6.1	5.7	< 1.0	< 1.0	< 1.0
TPH >C16-C21	EH 1D Total	N	2670	mg/kg	1.0	23	19	19	< 1.0	< 1.0	< 1.0
TPH >C21-C25	EH 1D Total	N	2670	mg/kg	1.0	97	86	95	< 1.0	< 1.0	< 1.0
TPH >C25-C35	EH 1D Total	N	2670	mg/kg	1.0	200	180	180	< 1.0	< 1.0	< 1.0
TPH >C35-C40	EH 1D Total	N	2670	mg/kg	1.0	29	24	34	< 1.0	< 1.0	< 1.0
Total TPH >C6-C40	EH 1D Total	U	2670	mg/kg	10	360	320	340	< 10	< 10	< 10
Naphthalene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene		N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene		M	2800	mg/kg	0.10	0.12	0.11	0.15	< 0.10	0.12	< 0.10
Anthracene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

Results - Soil

Project: Willow Street, Bury

Client: E3P		Chemtest Job No.:					25-28895	25-28895	25-28895	25-28895	25-28895	25-28895
Quotation No.: Q23-31421		Chemtest Sample ID.:					2023352	2023353	2023354	2023355	2023356	2023357
Order No.: 012160		Client Sample Ref.:					1	2	3	4	5	6
		Client Sample ID.:					TS101	TS102	TS103	SS101	SS102	SS103
		Sample Type:					SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Date Sampled:					02-Sep-2025	02-Sep-2025	02-Sep-2025	02-Sep-2025	02-Sep-2025	02-Sep-2025
		Time Sampled:					12:00	12:00	12:00	12:00	12:00	12:00
		Asbestos Lab:					DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	HWOL Code	Accred.	SOP	Units	LOD							
Fluoranthene		M	2800	mg/kg	0.10	0.13	0.15	0.20	< 0.10	0.16	< 0.10	
Pyrene		M	2800	mg/kg	0.10	0.14	0.14	0.21	< 0.10	0.15	< 0.10	
Benzo[a]anthracene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	
Chrysene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	
Benzo[b]fluoranthene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	
Benzo[k]fluoranthene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	
Benzo[a]pyrene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	
Indeno(1,2,3-c,d)Pyrene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	
Dibenz(a,h)Anthracene		N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	
Benzo[g,h,i]perylene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	
Total Of 16 PAH's		N	2800	mg/kg	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	
Total Phenols		M	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	

Test Methods

SOP	Title	Parameters included	Method summary	Water Accred.
2010	pH Value of Soils	pH at 20°C	pH Meter	
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <30°C.	
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES	
2175	Total Sulphur in Soils	Total Sulphur	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.	
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry	
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Alkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.	
2325	Sulphide in Soils	Sulphide	Steam distillation with sulphuric acid / analysis by 'Aquakem 600' Discrete Analyser, using N,N-dimethyl-p-phenylenediamine.	
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.	
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.	
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazine.	
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.	
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID	
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenzo[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS	
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.	

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Text example All items indicated in italic font represent customer-supplied information that may not be independently verified by the laboratory

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All results are expressed on a dry weight basis.

The following tests were analysed on samples 'as received' and the results subsequently corrected to a dry weight basis EPH, VPH, TPH, BTEX, VOCs, SVOCs, PCBs, Phenols.

For all other tests the samples were dried at $\leq 30^{\circ}\text{C}$ prior to analysis.

All Asbestos testing is performed at the indicated laboratory .

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1.

NEW_ASB Eurofins Chemtest Limited, 11 Depot Road, Newmarket, CB8 0AL

DURHAM Eurofins Chemtest Limited, Unit A North Wing, Prospect Business Park, Crookhall Lane, Consett, Co Durham, DH8 7PW

Sample Deviation Codes

As a result of any of the below deviations applying, the test results may be unreliable

A - Date of sampling not supplied

B - Sample age exceeds stability time (sampling to extraction)

C - Sample not received in appropriate containers

D - Broken Container

E - The required amount of sample for analysis was not received

H - Appropriate cooling measures were not taken for sample transportation

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt.

All water samples will be retained for 14 days from the date of receipt.

Report Information

Charges may apply to extended sample storage.

Water Sample Category Key for Accreditation

DW - Drinking Water (Non-Regulatory)
GW - Ground Water
LE - Land Leachate
NA - Not Applicable
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PW - Processed Water
RE - Recreational Water
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UL - Unspecified Liquid

Clean Up Codes

NC - No Clean Up
MC - Mathematical Clean Up
FC - Florisil Clean Up

HWOL Acronym System

HS - Headspace analysis
EH - Extractable hydrocarbons – i.e. everything extracted by the solvent
CU - Clean-up – e.g. by Florisil, silica gel
1D - GC – Single coil gas chromatography
Total - Aliphatics & Aromatics
AL - Aliphatics only
AR - Aromatic only
2D - GC-GC – Double coil gas chromatography
#1 - EH_2D_Total but with humics mathematically subtracted
#2 - EH_2D_Total but with fatty acids mathematically subtracted
+ - Operator to indicate cumulative e.g. EH+EH_Total or EH_CU+HS_Total

Asbestos Tests LOD = LOQ

Limit of Detection = Limit of Quantification for asbestos results only

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Appendix IV: Remediation/Validation Criteria





Human Health Remediation Targets – Residential End Use

DETERMINAND	UNIT	WITHIN 600 mm COVER SYSTEM	HARDSTANDING AND > 600 mm COVER SYSTEM	POS AND 300 mm COVER SYSTEM	POS AND > 300 mm COVER SYSTEM	PATHWAY
Arsenic	mg/kg	37(i)	40(ii)	79(iii)	170(iv)	1
Cadmium	mg/kg	11(i)	85(ii)	120(iii)	532(iv)	1
Chromium (Hexavalent)	mg/kg	6(i)	6(ii)	7.7(iii)	220(iv)	1
Lead	mg/kg	200(vi)	310(vii)	630(viii)	1300(viii)	1
Elemental Mercury	mg/kg	1.2(i)	1.2(ii)	16(iii)	30(iv)	2
Nickel	mg/kg	130(i)	180(ii)	230(iii)	800(iv)	1
Selenium	mg/kg	250(i)	430(ii)	1100(iii)	1800(iv)	1
Copper	mg/kg	2400(i)	7100(ii)	12000(iii)	44000(iv)	1
Zinc	mg/kg	3700(i)	40000(ii)	81000(iii)	170000(iv)	1
Phenol	mg/kg	120(i)(xi)	440(xiv)(xi)	440(iii)(xi)	440(iv)(xi)	2
Naphthalene	mg/kg	2.3(i)(xi)	2.3(xiv)(xi)	1200(iv)(xi)	1200(iv)(xi)	2
Acenaphthylene	mg/kg	170(i)(xi)	500(v)	15000(iii)(xi)	29000(iv)(xi)	3
Acenaphthene	mg/kg	210(i)(xi)	500(v)	15000(iii)(xi)	29000(iv)(xi)	1
Fluorene	mg/kg	170(i)(xi)	500(v)	9900(iii)(xi)	20000(iv)(xi)	1
Phenanthrene	mg/kg	95(i)(xi)	500(v)	3100(iii)(xi)	6200(iv)(xi)	3
Anthracene	mg/kg	500(i)(xi)	500(v)	74000(iii)(xi)	150000(iv)(xi)	3
Fluoranthene	mg/kg	280(i)(xi)	500(v)	3100(iii)(xi)	6300(iv)(xi)	3
Pyrene	mg/kg	500(i)(xi)	500(v)	7400(iii)(xi)	15000(iv)(xi)	3
Benzo(a)Anthracene(	mg/kg	7.2(i)(xi)	11(ii)(xi)	29(iii)(xi)	49(iv)(xi)	3
Chrysene	mg/kg	15(i)(xi)	30(ii)(xi)	57(iii)(xi)	93(iv)(xi)	3
Benzo(b)Fluoranthene (iii)	mg/kg	2.6(i)(xi)	3.9(ii)(xi)	7.1(iii)(xi)	13(iv)(xi)	3
Benzo(k)Fluoranthene (iii)	mg/kg	77(i)(xi)	110(ii)(xi)	190(iii)(xi)	370(iv)(xi)	3
Benzo(a)Pyrene (vii)	mg/kg	2.2(i)(xi)	3.2(ii)(xi)	5.7(iii)(xi)	11(iv)(xi)	3
Indeno(123-cd)Pyrene	mg/kg	27(i)(xi)	45(ii)(xi)	82(iii)(xi)	150(iv)(xi)	3
Dibenzo(a,h)Anthracene	mg/kg	0.24(i)(xi)	0.31(ii)(xi)	0.57(iii)(xi)	1.1(iv)(xi)	3
Benzo(ghi)Perylene	mg/kg	320(i)(xi)	360(ii)(xi)	640(iii)(xi)	1400(iv)(xi)	3
TPH C5-C6 (aliphatic)	mg/kg	42(i)(xi)	42(ii)(xi)	42(ii)(xi)	10000(xiv)(xi)	2
TPH C6-C8 (aliphatic)	mg/kg	100(i)(xi)	100(ii)(xi)	100(ii)(xi)	10000(xiv)(xi)	2
TPH C8-C10 (aliphatic)	mg/kg	27(i)(xi)	27(ii)(xi)	27(ii)(xi)	10000(xiv)(xi)	2
TPH C10-C12 (aliphatic)	mg/kg	130(i)(xi)	130(ii)(xi)	130(ii)(xi)	10000(xiv)(xi)	2
TPH C12-C16 (aliphatic)	mg/kg	1000(xiv)(xi)	1000(xiv)(xi)	1000(xiv)(xi)	10000(xiv)(xi)	1
TPH C16-C35 (aliphatic)	mg/kg	1000(xiv)(xi)	1000(xiv)(xi)	1000(xiv)(xi)	10000(xiv)(xi)	1
TPH C5-C7 (aromatic)	mg/kg	70(i)(xi)	370(ii)(xi)	370(ii)(xi)	10000(xiv)(xi)	2
TPH C7-C8 (aromatic)	mg/kg	130(i)(xi)	860(ii)(xi)	860(ii)(xi)	10000(xiv)(xi)	2
TPH C8-C10 (aromatic)	mg/kg	34(i)(xi)	47(ii)(xi)	47(ii)(xi)	10000(xiv)(xi)	2
TPH C10-C12 (aromatic)	mg/kg	74(i)(xi)	250(ii)(xi)	250(ii)(xi)	10000(xiv)(xi)	2



DETERMINAND	UNIT	WITHIN 600 mm COVER SYSTEM	HARDSTANDING AND > 600 mm COVER SYSTEM	POS AND 300 mm COVER SYSTEM	POS AND > 300 mm COVER SYSTEM	PATHWAY
TPH C12-C16 (aromatic)	mg/kg	140(i)(xi)	1800(ii)(xi)	1800(ii)(xi)	10000(xiv)(xi)	1
TPH C16-C21 (aromatic)	mg/kg	260(i)(xi)	1900(ii)(xi)	1900(ii)(xi)	10000(xiv)(xi)	1
TPH C21-C35 (aromatic)	mg/kg	1000(xiv)(xi)	1900(ii)(xi)	1900(ii)(xi)	10000(xiv)(xi)	1
Asbestos	Fibres Volume Weight	NFD	0.001%	NFD	0.001	1

Notes 1

Asbestos will be screened visually on-site by a qualified environmental consultant and where potential ACM is identified representative samples will be subject to quantitative analysis of 5&volume by weight. Should any ACM be identified within the soil matrices, further detailed % assessment would be required when the reported laboratory result exceeds the limit of detection for the analytical method at 0.01% by volume (weight).

Notes 2

Excludes matrices where free product is observed;
Commercial Tier 1 GAC modelled to assume no exposure pathway; and,
No viable exposure pathway beneath hard standing and cover system.

Notes 3

Main Exposure Pathways: 1 = Soil Ingestion, 2 = Vapour Inhalation (indoor), 3 = Dermal Contact & Ingestion, 4 = Dust Inhalation.

Abbreviations: GAC = General Assessment Criteria, n = number of samples, MC = Maximum Concentration; NA – Not Applicable (no exceedance of assessment criteria); Loc of MC = Location of Exceedances

(i) Value derived from LQM Sutable 4 Use Levels (S4ULs) for residential end use with plant uptake.

(ii) Value derived from LQM Sutable 4 Use Levels (S4ULs) for residential end use without plant uptake – these levels used below 600mm cover system within residential gardens as soils will be present within a residential setting yet soils will not be disturbed and garden plants will not reach these soils.

(iii) Value derived from LQM Sutable 4 Use Levels (S4ULs) for Public open Space (POS) residential.

(iv) Value derived from LQM Sutable 4 Use Levels (S4ULs) for Public Open Space (POS) park – these levels used below 300mm POS cover system as soils will not be disturbed by any future site users and exposure to these soils will be similar to a park end use.

(v) Value derived from LQM Sutable 4 Use Levels (S4ULs) alongside assessment with WM3 to ensure that materials remaining on site do not exceed the WM3 toxicity criteria for hazardous waste.

(vi) Value derived from Category 4 Screening Levels (C4SL) for residential land use with homegrown produce.

(vii) Value derived from Category 4 Screening Levels (C4SL) for residential land use without homegrown produce.

(viii) Value derived from Category 4 Screening Levels (C4SL) for Public open Space (POS) residential.

(ix) Value derived from Category 4 Screening Levels (C4SL) for Public Open Space (POS) park.

(x) Mercury – Based on elemental Mercury.

(xi) PAH and TPH levels used are for 1% SOM.

(xii) Xylenes based on p-xylene (o-xylene 2600mg/kg, m-xylene 3500mg/kg) and is capped by its solubility.

(xiii) Value derived from LQM Sutable 4 Use Levels (S4ULs) for residential end use with plant uptake due to the volatilisation risk.

(xiv) BTEX is not SOM related due to inhalation pathway.

Appendix VIII: Photos





PLATE 1 GROUND CONDITIONS (BUILDING FOOTPRINT)



PLATE 2 EXCAVATION OF TRENCHES FOR BUILDING FOUNDATIONS



PLATE 3 INSPECTION FOR THE INSTALLATION OF LIFT PIT



PLATE 4 INSTALLATION OF VAPOR GAS MEMBRANE





PLATE 5 BUILD PHASE WITH OVERHANG OF GAS MEMBRANE



Additional pictures can be provided on request.